

## CURRICULUM VITAE

ROBERT ROTHLEIN, Ph.D.

Home Address: 32 Tamanny Trail  
Danbury, CT 06811

Telephone: (203) 790-5359

### EDUCATION

Ph.D. in Immunology, Cornell University Graduate School of Medical Sciences, New York, NY. Degree granted 1982.

M.S. in Veterinary Microbiology, University of Minnesota, Minnesota, MN. Degree granted 1978.

B.A. in Chemistry, University of Vermont, Burlington, VT. Degree granted 1972.

### INDUSTRIAL EXPERIENCE

Highly Distinguished Scientist (November 1991-Present) Boehringer Ingelheim Pharmaceuticals, Inc, Ridgefield, CT Responsible for directing coordinating the Cellular Adhesion Program.

Section Leader, Inflammatory Diseases, Department of Immunology (January 1990 - October 1991) Boehringer Ingelheim Pharmaceuticals, Inc, Ridgefield, CT Responsible for coordinating the Cellular Adhesion Program.

Senior Principal Scientist, Department of Immunology (January 1989-January 1990) Boehringer Ingelheim Pharmaceuticals, Inc, Ridgefield, CT Responsible for coordinating the Cellular Adhesion Program.

Principal Scientist, Department of Immunology (October 1985-December 1988) Boehringer Ingelheim Pharmaceuticals, Inc, Ridgefield, CT Responsible for developing the Cellular Adhesion Program.

Senior Pharmacologist, Department of Pharmacology (March 1985-October 1985) Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT. Responsible for development and implementation of immunological assays related to allergy.

## ACADEMIC EXPERIENCE

Adjunct Associate Professor of Microbiology and Immunology (Sept 1992-present)  
New York Medical College, Valhalla, NY.

Adjunct Assistant Professor of Microbiology and Immunology (May 1986-present)  
New York Medical College, Valhalla, NY.

Postdoctoral Research Fellow (September 1983-March 1985) Dana-Farber Cancer  
Institute, Boston, MA, Harvard Medical School, Laboratory of Membrane  
Immunochemistry and Department of Pathology.

Postdoctoral Research Fellow (October 1982- August 1983) Sloan-Kettering Institute for  
Cancer Research, Rye, NY, Laboratory of Ontogeny of the Immune  
System.

Associate Researcher (May 1982-September 1982) Sloan-Kettering Institute for Cancer  
Research, Rye, NY, Laboratory of Ontogeny of the Immune System.

Graduate Research Assistant (September 1981-April 1982) Sloan-Kettering Institute for  
Cancer Research, Rye, NY, Laboratory of Ontogeny of the Immune  
System.

Predoctoral Research Fellow (September 1978-August 1981) Sloan-Kettering Institute  
for Cancer Research, Rye, NY.

Graduate Research Assistant (June 1976-August 1978) University of Minnesota,  
Minnesota, MN, Department of Large Animal Clinical Sciences.

Research Technician (July 1973-May 1976) Sloan-Kettering Institute for Cancer  
Research, Rye, NY, Laboratory of Ontogeny of the Immune System.

## HONORS AND AWARDS

NRSA Institutional Fellowship Award

NRSA Individual Fellowship Award

Boehringer Ingelheim Pharmaceuticals, Inc. Award for Outstanding Scientific  
Achievement - 1989

## **SOCIETY MEMBERSHIPS**

American Association of Immunologists

Association for Gnotobiotics

Sigma Xi, Cornell Chapter

Society of Leukocyte Biology

## **EDITORIAL BOARDS**

Associate Editor of the Journal of Immunology- 1992-1995

Member of the Advisory Board of Experimental Dermatology- 1993-present

## **PERSONAL FACTORS**

Place of Birth: New York, NY

Marital Status: Married, two children.

Social Security: 119-40-3473

## ARTICLES

- SETCAVAGE, T.M., ROTHLEIN, R., MUSCOPLAT, C.C. AND KIM, Y.B. A Novel Receptor for Secretory Component on Porcine Mononuclear Cells. **Cell. Immunol.** 27: 47-51, 1976.
- ROTHLEIN, R., JOHNSON, D.W. AND MUSCOPLAT, C.C. Enumeration and Characterization of Bovine Blood, Spleen and Lymph Node Cells Containing Immunoglobulins. **Int. Arch. Allergy Appl. Immunol.** 61:100-106, 1980.
- ROTHLEIN, R., GALLILY, R. AND KIM, Y.B. Development of Alveolar Macrophages in Specific Pathogen-Free and Germ-Free Minnesota Miniature Swine. **J. Reticuloendothel. Soc.** 30: 483-495, 1981.
- ROTHLEIN, R. AND KIM, Y.B. Porcine Alveolar Macrophages Discriminate Between Self and Nonself in Lectin-Mediated Cellular Cytotoxicity. **Cell. Immunol.** 68: 368-376, 1982.
- ROTHLEIN, R. AND KIM, Y.B. Role of Fc Receptor Modulation by Immobilized immune Complexes in Generation of Nonspecific (bystander) Cytotoxicity for Autologous and Xenogeneic Targets by Porcine Alveolar macrophages. **J. Immunol.** 129: 1859, 1982.
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- ROTHLEIN, R. AND SPRINGER, T.A. Complement Receptor Type Three-Dependent Degradation of Opsonized Erythrocytes by Mouse Macrophages. **J. Immunol.** 135: 2668, 1985.
- ANDERSON, D.C., SCHMALSTIEG, F.C., FINEGOLD, M.J., HUGHES, B.J., ROTHLEIN, R., MILLER, L.J., KOHN, S., TOSI, M.F., JACOBS, R.L., WALDROP, T.C., GOLDMAN, A.S., SHEARER, W.T. AND SPRINGER, T.A. The Severe and Moderate Phenotypes of Heritable Mac-1, LFA-1, p150,95 Deficiency: Their Quantitative Definition and Relation to Leukocyte Dysfunction and Clinical Features. **J. Infect. Dis.** 152:668, 1985.

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- ROTHLEIN, R. AND SPRINGER, T.A. The Requirement for Lymphocyte Function-Associated Antigen 1 in Homotypic Leukocyte Adhesion Stimulated by Phorbol ester. **J. Exp. Med.** 163: 1132, 1986.
- ANDERSON, D.C., MILLER, L.J., SCHMATSTIEG, F.C., ROTHLEIN, R. AND SPRINGER T.A. Contributions of the MAC-1 Glycoprotein Family to Adherence-Dependent Granulocyte Functions: Structure-Function Assessments Employing Subunit Specific Monoclonal Antibodies. **J. Immunol.** 137:15, 1986.
- ROTHLEIN, R., DUSTIN, M.L., MARLIN, S.D. AND SPRINGER T.A. A Human Intercellular Adhesion Molecules (ICAM-1) distinct from LFA-1. **J. Immunol.** 137: 1270, 1986.
- DUSTIN, M.L., ROTHLEIN, R., BHAN, A.K., DINARELLO, C.A. AND SPRINGER T.A. Induction by IL-1 and Interferon-Gamma, Tissue Distribution, Biochemistry and Function of a Natural Adherence Molecule (ICAM-1). **J. Immunol.** 137: 245, 1986.
- POBER, J.S., GIMBRONE Jr., M.A., LAPIERRE, L.A., MENDRICK, D.L., FIERS, W., ROTHLEIN, R. AND SPRINGER, T.A. Activation of Human Endothelial Cells by Lymphokines: Overlapping Patterns of Antigenic Modulation by Interleukin-1, Tumor Necrosis Factor and Immune Interferon. **J. Immunol.** 137: 1893, 1986.
- LANGE WANTZIN, G., ROTHLEIN, R., KAHN, J. AND FAANES, R.B. UV Irradiation Effect on Membrane-Associated IL-1 Expression. **J. Immunol.** 138:3803-3807, 1987.
- MERLUZZI, V.J., FAANES, R.B., CZAJKOWSKI, M., LAST-BARNEY, K., HARRISON, P.C., KAHN, J. AND ROTHLEIN, R. Membrane-Associated Interleukin-1 Activity on Human U937 Tumor Cells: Stimulation of PGE2 Production by Human Chondrosarcoma Cells. **J. Immunol.** 139: 166-168, 1987.
- LANGE WANTZIN, G., ROTHLEIN, R., KAHN, J. AND FAANES, R.B. Effect of UV Irradiation on Expression of Membrane IL 1 By Rat Macrophages. **J. Immunol.** 138: 3803-3807, 1987.

## ARTICLES (Cont'd)

- SMITH, C.W., ROTHLEIN, R., HUGHES, B.J., MARISCALCO, M.M., SCHMALSTIEG, F.C. AND ANDERSON, D.C. Recognition of Endothelial Determinant for CD18-Dependent Human Neutrophil Adherence and Transendothelial Migration. **J. Clin. Invest.**, 82: 1746-1756, 1988.
- MENTZER, S.J., ROTHLEIN, R., SPRINGER, T.A. AND FALLER, D.V. Intercellular Adhesion Molecule-1 (ICAM-1) Is Involved in the Cytolytic T Lymphocyte Interaction With a Human Synovial Cell Line. **J. Cell Physiol.** 137: 173-178, 1988.
- LANGE WANTZIN, G., RALFKIAER, E., LISBY, S. AND ROTHLEIN, R. The Role of Intercellular-Adhesion Molecules in Inflammatory Skin Reactions. **British J. Derm.** 119: 141-145, 1988.
- ROTHLEIN, R., CZAJKOWSKI, M., O'NEILL, M.M., MARLIN, S.D. MAINOLFI, E., AND MERLUZZI, V.J. Induction of Intercellular-Adhesion Molecule-1 on Primary and Continuous Cell-Lines by Pro-Inflammatory Cytokines - Regulation by Pharmacologic Agents and Neutralizing Antibodies. **J. Immunol.** 141:1665-1669, 1988.
- LISBY, S., RALFKIAER, E., ROTHLEIN, R., AND LANG WANTZIN, G. Intercellular Adhesion Molecule-1 (ICAM-1) Expression Correlated to Inflammation. **British J. Derm.** 120: 479-484, 1989.
- STAUNTON, D.E., MERLUZZI, V.J., ROTHLEIN, R., BARTON, R.W., MARLIN, S.D. AND SPRINGER, T.A. A Cell Adhesion Molecule, ICAM-1, Is the Major Surface Receptor For Rhinoviruses. **Cell** 56: 849-853, 1989.
- SMITH, C.W., MARLIN, S.D., ROTHLEIN, R., TOMAN, C., AND ANDERSON, D.C. Cooperative Interactions of LFA-1 and MAC-1 with ICAM-1 in Facilitating Adherence and Transendothelial Migration of Human Neutrophils. **J. Clin. Invest.**, 83: 2008-2017, 1989.
- BARTON, R.W., ROTHLEIN, R., KSIAZEK AND KENNEDY, C. The Effect of Anti-Intercellular Adhesion Molecule-1 on phorbol-Ester-Induced Rabbit Lung Inflammation. **J. Immunol.** 143: 1278-1282, 1989.
- ADAMS, D.H., HUBSCHER, S.G., SHAW, J., ROTHLEIN, R., NEUBERGER, J.M. Intercellular Adhesion Molecule 1 on Liver Allografts During Rejection. **Lancet** 8672: 1122-1125, Nov. 11, 1989.

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- LANGE WANTZIN, G., RALFKIAER, E., AVNSTORP, C., CZAJKOWSKI, M., MARLIN, S.D. AND ROTHLEIN, R. Kinetics and Characterization of Intercellular Adhesion Molecule-1 (ICAM-1) Expression on Keratinocytes in Various Inflammatory Skin Lesions and Malignant Cutaneous Lymphomas. **J. Am. Acad. Derm.** 20: 782-790, 1989.
- WEGNER, C.D., GUNDEL, R., REILLY, P., HAYNES, N., LETTS, G.L. AND ROTHLEIN, R. Interceullar Adhesion Molecule-1 (ICAM-1) in the Pathogenesis of Asthma. **Science** 247: 456-247, 1990.
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- COSIMI, A.B., CONTI, D., DELMONICO, F.L., PREFFER, F.I., WEE, S.-L., ROTHLEIN, R., FAANES, R.B. AND COLVIN, R.B. In Vivo Effects of Monoclonal Antibody to ICAM-1 (CD54) in Nonhuman Primates with Renal Allografts. **J. Immunol.** 144: 4604-4612, 1990.
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- ANDERSON, D.C., ROTHLEIN, R., MARLIN, S.D., KRATER, S.S. AND SMITH, C.W. Impaired Transendothelial Migration By Neonatal Neutrophils: Abnormalities of MAC-1 (CD11b/CD18)-ICAM-1 Dependent Adherence Reactions. **Blood** 76: 2613-21, 1990.
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- ARGENBRIGHT, L.W., LETTS, L.G. AND ROTHLEIN, R. Monoclonal Antibodies to the Leukocyte Membrane CD18 Glycoprotein Complex and to Inter cellular Adhesion Molecule-1 Inhibit Leukocyte-Endothelial Adhesion in Rabbits. **J. Leuk. Biol.** 49: 253-7, 1991.
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- WEE, S.L., COSIMI, A.B., PREFFER, F.I., ROTHLEIN, R., FAANES, R., CONTI, D., AND COLVIN, R.B. Functional Consequences of Anti-ICAM-1 (CD54) in Cynomolgus Monkeys With Renal Allografts. **Transplant. Proceed.** 23: 279-80, 1991.
- HARNING, R., MAINOLFI, E., BYSTRYN, J.-C., HENN, M., MERLUZZI, V.J. AND ROTHLEIN, R. Serum Levels of Circulating Inter cellular Adhesion Molecule 1 in Human Malignant Melanoma. **Cancer Res.** 51: 5003-5005, 1991.
- SALAFIA, C.M., HAYNES, N., MERLUZZI, V.J. AND ROTHLEIN, R. The Distribution of ICAM-1 Within Decidua and Placenta and Gestational Age-Associated Changes. **Pediatric Pathology.** 11:381-8, 1991.
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- GUNDEL, R. H., WEGNER, C. D., TORCELLINI, C. A., CLARKE, C. C., HAYNES, N., ROTHLEIN, R., SMITH, C. W., LETTS, L.G. Endothelial Leukocyte Adhesion Molecule-1 Mediates Antigen-Induced Acute Airway Inflammation and Late-Phase Airway Obstruction in Monkeys. **Journal of Clinical Investigation.** 88:1407-11, 1991.



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- CLARK, W. M., MADDEN, K. P., ROTHLEIN, R., ZIVIN, J. A. Reduction of Central Nervous System Ischemic Injury by Monoclonal Antibody to Intercellular Adhesion Molecule. **Journal of Neurosurgery**. 75:623-7, 1991.
- ADAMS, D. H., HUBSCHER, S. G., SHAW, J., JOHNSON, G. D., BABBS, C., ROTHLEIN, R., NEUBERGER, J. M. Increased Expression of Intercellular Adhesion Molecule 1 on Bile Ducts in Primary Biliary Cirrhosis and Primary Sclerosing Cholangitis. **Hepatology**. 14:426-31, 1991.
- CLARK, W. M., MADDEN, K. P., ROTHLEIN, R., ZIVIN, J. A. Reduction of Central Nervous System Ischemic Injury in Rabbits using Leukocyte Adhesion Antibody Treatment. **Stroke**. 22:877- 83, 1991.
- HANSEN, N. L., RALFKIAER, E., HOU-JENSEN, K., THOMSEN, K., DRZEWIECKI, K. T., ROTHLEIN, R., VEJLSGAARD, G. L. Expression of Intercellular Adhesion Molecule-1 (ICAM-1) in Benign Naevi and Malignant Melanomas. **Acta Dermato-Venereologica**. 71:48-51, 1991.
- DREYER, W. J., MICHAEL, L. H., WEST, M., S., SMITH, C. W., ROTHLEIN, R., ROSSEN, R. D., ANDERSON, D. C., ENTMAN, M. L. Neutrophil Accumulation in Ischemic Canine Myocardium. Insights into Time Course, Distribution, and Mechanism of Localization During Early Reperfusion. **Circulation**. 84:400-11, 1991.
- HORGAN MJ. GE M. GU J. ROTHLEIN R. MALIK AB. Role of ICAM-1 in neutrophil-mediated lung vascular injury after occlusion and reperfusion. **American Journal of Physiology**. 261:H1578-84, 1991.
- WEGNER CD. ROTHLEIN R. GUNDEL RH. Adhesion molecules in the pathogenesis of asthma. **Agents & Actions - Supplements**. 34:529-44, 1991.
- NOONAN TC. GUNDEL RH. DESAI SN. STEARNS C. BARTON RW. ROTHLEIN R. LETTS LG. PIPER PJ. The effects of an anti-CD18 antibody (R15.7) in antigen-induced airway hyperresponsiveness (AH) and cell influx in guinea pigs. **Agents & Actions**. 34:211-3, 1991.
- GUNDEL RH. WEGNER CD. TORCELLINI CA. CLARKE CC. HAYNES N. ROTHLEIN R. SMITH CW. LETTS LG. Endothelial leukocyte adhesion molecule-1 mediates antigen-induced acute airway inflammation and late-phase airway obstruction in monkeys. **Journal of Clinical Investigation**. 88:1407-11, 1991.

## ARTICLES (Cont'd)

- MILESKI W. BORGSTROM D. LIGHTFOOT E. ROTHLEIN R. FAANES R. LIPSKY P. BAXTER C. Inhibition of leukocyte-endothelial adherence following thermal injury. **Journal of Surgical Research**. 52:334-9, 1992.
- JASIN H. LIGHTFOOT E. DAVIS L. ROTHLEIN R. FAANES RB. LIPSKY PE. Amelioration of antigen-induced arthritis in rabbits treated with monoclonal antibodies to leukocyte adhesion molecules. **Arthritis & Rheumatism**. 35:541-9, 1992.
- LAMPETER ER. KISHIMOTO TK. ROTHLEIN R. MAINOLFI EA. BERTRAMS J. KOLB H. MARTIN S. Elevated levels of circulating adhesion molecules in IDDM patients and in subjects at risk for IDDM. **Diabetes**. 41:1668-71, 1992.
- LAL RB. MAINOLFI E. ROTHLEIN R. Elevated levels of cICAM-1 in patients with human T-cell leukemia virus type I associated myelopathy and adult T-cell leukemia [letter]. **Blood**. 80:2434-5, 1992.
- GOLDMAN G. WELBOURN R. ROTHLEIN R. WILES M. KOBZIK L. VALERI CR. SHEPRO D. HECHTMAN HB. Adherent neutrophils mediate permeability after atelectasis. **Annals of Surgery**. 216:372-8; discussion 378-80, 1992.
- SHERMAN MP. JOHNSON JT. ROTHLEIN R. HUGHES BJ. SMITH CW. ANDERSON DC. Role of pulmonary phagocytes in host defense against group B streptococci in preterm versus term rabbit lung. **Journal of Infectious Diseases**. 166:818-26, 1992.
- WEGNER CD. WOLYNIEC WW. LAPLANTE AM. MARSCHMAN K. LUBBE K. HAYNES N. ROTHLEIN R. LETTS LG. Intercellular adhesion molecule-1 contributes to pulmonary oxygen toxicity in mice: role of leukocytes revised. **Lung**. 170:267-79, 1992.
- MA XL. LEFER DJ. LEFER AM. ROTHLEIN R. Coronary endothelial and cardiac protective effects of a monoclonal antibody to intercellular adhesion molecule-1 in myocardial ischemia and reperfusion. **Circulation**. 86:937-46, 1992.
- YOSHIDA N. GRANGER DN. ANDERSON DC. ROTHLEIN R. LANE C. KVIETYS PR. Anoxia/reoxygenation-induced neutrophil adherence to cultured endothelial cells. **American Journal of Physiology**. 262(6 Pt 2):H1891-8, 1992.

## ARTICLES (Cont'd)

- HAUG CE. COLVIN RB. DELMONICO FL. AUCHINCLOSS H JR. TOLKOFF-RUBIN N. PREFFER FI. ROTHLEIN R. NORRIS S. SCHARSCHMIDT L. COSIMI AB. A phase I trial of immunosuppression with anti-ICAM-1 (CD54) mAb in renal allograft recipients. **Transplantation**. 55:766-72; discussion 772-3, 1993 .
- ROTHLEIN R. KENNEDY C. CZAJKOWSKI M. BARTON RW. Generation and characterization of an anti-idiotypic antibody specific for intercellular adhesion molecule-1. **International Archives of Allergy & Immunology**. 100:121-7, 1993.
- BOWES MP. ZIVIN JA. ROTHLEIN R. Monoclonal antibody to the ICAM-1 adhesion site reduces neurological damage in a rabbit cerebral embolism stroke model. **Experimental Neurology**. 119:215-9, 1993 .
- ADAMS DH. MAINOLFIE E. ELIAS E. NEUBERGER JM. ROTHLEIN R. Detection of circulating intercellular adhesion molecule-1 after liver transplantation--evidence of local release within the liver during graft rejection. **Transplantation**. 55:83-7, 1993 .
- CUSH JJ. ROTHLEIN R. LINDSLEY HB. MAINOLFIE EA. LIPSKY PE. Increased levels of circulating intercellular adhesion molecule 1 in the sera of patients with rheumatoid arthritis. **Arthritis & Rheumatism**. 36:1098-102, 1993.
- BROWN KA. PERRY ME. MUSTAPHA Y. ROTHLEIN R. DUMONDE DC. Immuno-electron microscopic analysis of the distribution of ICAM-1 in human inflammatory tissue. **Agents & Actions**. 38 Spec No:C35-8, 1993.
- EICHACKER PQ. HOFFMAN WD. FARESE A. DANNER RL. SUFFREDINI AF. WAISMAN Y. BANKS SM. MOUGINIS T. WILSON L. ROTHLEIN R. ET AL. Leukocyte CD18 monoclonal antibody worsens endotoxemia and cardiovascular injury in canines with septic shock. **Journal of Applied Physiology** 74:1885-92, 1993
- CLARK WM. COULL BM. BRILEY DP. MAINOLFIE E. ROTHLEIN R. Circulating intercellular adhesion molecule-1 levels and neutrophil adhesion in stroke. **Journal of Neuroimmunology**. 44:123-5, 1993

## ARTICLES (Cont'd)

- SALAFIA CM. DEVORE GR. MAINOLFI E. KELLY J. PEZZULLO JC. ROTHLEIN R. Circulating intercellular adhesion molecule-1 in amniotic fluid, maternal serum alpha-fetoprotein levels, and intrauterine growth retardation. **Am J Obstet. Gynecol.** 169(4):830-4, 1993
- ROTHLEIN R. KISHIMOTO TK. MAINOLFI E. Cross-linking of ICAM-1 induces co-signalling of an oxidative burst from mononuclear leukocytes. **J. of Immunol.** 152:2488-2495, 1994,
- MORELOCK M.M., ROTHLEIN R., BRIGHT S.M., ROBINSON M.K., GRAHAM E.T., SABO J.P. OWENS R., KING D.J., NORRIS S.H., SCHER D.S. WRIGHT J. L., ADAIR J.R. Isotype choice for chimeric antibodies affects binding properties. **J. Biol. Chem.** 269:13048-13055, 1994.
- KAVANAUGH A.F., DAVIS L.S., NICHOLS L.A., NORRIS S.H., ROTHLEIN R., SCHARSCHMIDT L.A., LIPSKY P.E. Treatment of Refractory Rheumatoid Arthritis with a Monoclonal Antibody to Intercellular Adhesion Molecule 1. **J. Arthritis Rheum.** 37:992-999, 1994.
- ZENG Y., GAGE A., MONTAG A., ROTHLEIN R., THISTLETHWAITE J.R., BLUESTONE J.A. Inhibition of Transplant Rejection by Pretreatment of Xenogeneic Pancreatic Islet Cells with Anti-ICAM-1 Antibodies. **J. Transplantation** 58:681-689, 1994.
- ANDREOLI SP. MALLETT C. WILLIAMS K. MCATEER JA. ROTHLEIN R. DOERSCHUK Mechanisms of polymorphonuclear leukocyte mediated peritoneal mesothelial cell injury. **Kidney International.** 46:1100-9, 1994.
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## ARTICLES (Cont'd)

- DORE-DUFFY P. NEWMAN W. BALABANOV R. LISAK RP. MAINOLFI E. ROTHLEIN R. PETERSON M. Circulating, soluble adhesion proteins in cerebrospinal fluid and serum of patients with multiple sclerosis: correlation with clinical activity. **Annals of Neurology**. 37:55-62, 1995
- KISHIMOTO TK. KAHN J. MIGAKI G. MAINOLFI E. SHIRLEY F. INGRAHAM R. ROTHLEIN R. Regulation of L-selectin expression by membrane proximal proteolysis. **Agents & Actions - Supplements**. 47:121-34, 1995.
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- MICKELSON JK. KUKIELKA G. BRAVENEC JS. MAINOLFI E. ROTHLEIN R. HAWKINS HK. KELLY JH. SMITH CW. Differential expression and release of CD54 induced by cytokines. **Hepatology**. 22:866-75, 1995.
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## REVIEWS AND CHAPTERS

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